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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ANIL D. JHA, FREDERICK WILKINS,
EVGENIYA FREYDINA, AYTAC SEZGI,
RESHMA MADHUSUDAN, and
MICHAEL REARDON

Appeal 2009-000740
Application 10/712,621
Technology Center 1700

Decided: December 14, 2009

Before ALLEN R. MACDONALD, *Vice Chief Administrative Patent Judge*,
and LINDA M. GAUDETTE and JEFFREY B. ROBERTSON,
Administrative Patent Judges.

GAUDETTE, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's
decision finally rejecting claims 21-29, 40-45, 51, 53, 54, and 62-70 (Final

Office Action (“Final”), mailed Jan. 11, 2007)¹. (Appeal Brief (“App. Br.”), filed Nov. 6, 2007, p. 5; Reply Brief (“Rep. Br.”), filed Feb. 20, 2008, p. 5.) We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM-IN-PART.

STATEMENT OF THE CASE

The invention relates to a water treatment system and method which utilize an electrochemical device with a reservoir system for delivering treated water to a point of use. (Specification (“Spec.”) 1:9-11.) Of the appealed claims, there are six independent claims: 21, 40, 51, 62, 68, and 70. Claims 21, 62, and 70 are illustrative of the claimed invention and are reproduced from the Claims Appendix to the Appeal Brief:

21. A treatment system comprising:

a reservoir system fluidly connected to a point of entry;

an electrochemical device fluidly connected to the reservoir system;

a point of use fluidly connected to the reservoir system; and

an auxiliary use fluidly connected to a waste stream from the electrochemical device.

62. A method for treating water comprising:

accumulating water from a point of entry at a pressure that is above atmospheric pressure;

providing an electrochemical device;

¹ The Final Office Action identifies claim 52 as pending and finally rejected. However, claim 52 was canceled in a Supplemental Response under 37 C.F.R. § 1.116, filed Aug. 9, 2006. (App. Br. 7.)

transferring at least a portion of the accumulated water to the electrochemical device;

removing at least a portion of any undesirable species from the water in the electrochemical device to produce a treated water; and

adjusting at least one operating parameter of the electrochemical device.

70. A method for facilitating water treatment comprising:

providing a system comprising a pressurizable reservoir system that is fluidly connectable to a point of entry and an electrochemical device fluidly connected to the pressurizable reservoir system and fluidly connectable to a water distribution system.

Appellants request review of the following grounds of rejection (App. Br. 12):

1. claims 21-26, 40, 41, 44, and 45 under 35 U.S.C. § 102(e) as anticipated by Willman (US 2004/0118780 A1, published Jun 24, 2004);
2. claim 26 under 35 U.S.C. § 103(a) as unpatentable over Willman in view of Rela (US 6,607,668 B2, issued Aug. 19, 2003);
3. claims 27 and 42 under 35 U.S.C. § 103(a) as unpatentable over Willman in view of Sato (US 6,733,646 B2, issued May 11, 2004);
4. claim 28 under 35 U.S.C. § 103(a) as unpatentable over Willman in view of Hirayama (US 6,461,512 B1, issued Oct. 8, 2002);
5. claims 29 and 43 under 35 U.S.C. § 103(a) as unpatentable over Willman in view of Arba (US 6,398,965 B1, issued Jun. 4, 2002);
6. claims 62, 65-67, and 70 under 35 U.S.C. § 102(e) as anticipated by Willman;

7. claims 51, 53, 54, 62, 65, and 68-70 under 35 U.S.C. § 102(b) as anticipated by Hirayama²; and
8. claims 63 and 64 under 35 U.S.C. § 103(a) as unpatentable over Hirayama in view of Sato.

ISSUES

Appellants' traversal of grounds of rejection 1-5 is based, in part, on their contention that the primary reference, Willman, fails to disclose a treatment system in which an auxiliary use receives a waste stream/discharge water from an electrochemical device in the manner recited in independent claims 21 and 40. (App. Br. 21 and 23.) Similarly, Appellants' traversal of grounds of rejection 6-8 is based on their contention that the primary references, Willman and Hirayama, do not disclose the use of a pressurized tank or reservoir for accumulating water at pressures above atmospheric pressure as required by independent claims 51, 62, 68, and 70 (App. Br. 24, 25, 28, and 30-31.) Based on these arguments, we identify the following issues as potentially dispositive of the appeal:

1. Have Appellants shown reversible error in the Examiner's findings that Willman's water purification system and method in which the output stream 81/73 from a capacitive deionization module 66/64 is connected to a product dispenser 104 (Ans. 5) anticipates
 - a. "an auxiliary use fluidly connected to a waste stream from the electrochemical device" as recited in claim 21, and
 - b. "transferring a portion of the discharge water to an auxiliary use" as recited in claim 40?

²Appellants inadvertently identify cancelled claim 52 (*see supra* note 1) as subject to this ground of rejection.

2. Have Appellants shown reversible error in the Examiner's findings that Willman uses a booster pump 16 and a transfer pump 58 to pressurize a storage tank 26, thereby anticipating
 - a. "accumulating water from a point of entry at a pressure that is above atmospheric pressure" as recited claim 62, and
 - b. "a pressurizable reservoir system" as recited in claim 70?
3. Have Appellants shown reversible error in the Examiner's findings that Hirayama's use of several pumps upstream of a storage tank 7 in the disclosed water purification system and method anticipates
 - a. "accumulating water from a point of entry at a pressure that is above atmospheric pressure" as recited claim 62,
 - b. "means for accumulating water from a water source at a pressure above atmospheric pressure" as recited in claim 51,
 - c. "a pressurized fluid reservoir" as recited in claim 68, and
 - d. "a pressurizable reservoir system" as recited in claim 70?

SUMMARY OF DECISION

After considering the arguments of the Examiner and Appellants, we determine that Appellants have identified reversible error in the Examiner's findings with respect to the above-identified limitations in claims 21, 40, 51, 62, and 68 (issues 1a & b, 2a, and 3a-c), but have not identified reversible error in the Examiner's findings with respect to claim 70 (issues 2b and 3d). Therefore, we do not sustain the rejections of claims 21, 40, 51, 62, and 68, nor do we sustain the rejections of the claims dependent therefrom: claims 22-29, 41-45, 53, 54, 63-67, and 69. (*See* Grounds of Rejection 1-8.) Because Appellants' arguments with respect to claim 70 do not present any

additional issues for our consideration (*see* App. Br. 28, 30-31 and Rep. Br. 16-19), we sustain the rejection of claim 70 under 35 U.S.C. § 102(e) as anticipated by Willman and the rejection of claim 70 under 35 U.S.C. § 102(b) as anticipated by Hirayama. (*See* Grounds of Rejection 6 and 7.)

FINDINGS OF FACT, PRINCIPLES OF LAW, AND ANALYSIS

Issue 1

Figure 4 of Willman is reproduced below:

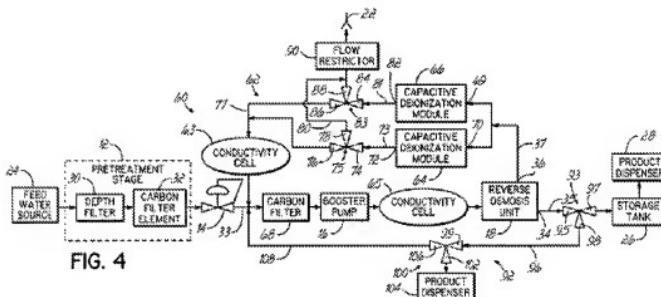


FIG. 4

Willman Fig. 4, above, illustrates a water purification system (Willman, ¶ [0014]) for providing purified water for end uses such as laboratories and drinking water (Willman, ¶ [0015]).

Willman's water purification system utilizes a reverse osmosis (RO) unit 18 to remove dissolved ions and organic matter in feed water 24. (Willman, ¶ [0018].) The RO unit 18 creates two separate streams: a permeate stream 34, which is depleted of dissolved ions and a concentrate stream 36 which is enriched in dissolved ions. (Willman, ¶¶ [0007] and [0018].) The concentrate stream 36 is directed to a pair of capacitive deionization (CDI) modules 64, 66. (Willman, ¶ [0030].) In purification

mode, the CDI modules 64, 66 electrostatically trap dissolved ions in the concentrate stream “to provide an output stream significantly depleted of dissolved ions.” (Willman, ¶ [0020].) The output stream is combined with the feed water stream and the combined streams enter the RO unit 18. (Willman, ¶ [0020].) The permeate stream 34 may be directed to storage tank 26 “which collects the high-purity water for subsequent dispensing from product dispenser 28.” (Willman, ¶ [0019].) Alternatively, the permeate stream 34 is diverted to a recirculation path 92 where it may be drawn off through product dispenser 104 or admixed with the output stream from the CDI modules 64, 66 for recirculation to the RO unit 18. (Willman, ¶ [0034-0036].)

Claim 21 recites “an auxiliary use fluidly connected to a waste stream from the electrochemical device.” Claim 40 recites “transferring a portion of the discharge water to an auxiliary use.”

The Examiner finds that these claim limitations are met by Willman’s disclosure of electrochemical devices 66, 70 having waste streams 72/73, 81/82 which are fluidly connected to an auxiliary point of use 104. (Ans. 5.) The Examiner relies on these findings in rejecting claims 21-29 and 40-45. (Ans. 5-6 and 9-10.)

Appellants argue that the stream entering the product dispenser 104 is permeate water, or purified water. (App. Br. 21 and 23.) Appellants contend that this stream is not a waste stream or discharge water from an electrochemical device as required by the claims. (*Id.*)

Based on these arguments, we determine that the Examiner and Appellants disagree on the scope and meaning of the claim terms “waste stream” (claim 21) and “discharge water” (claim 40). Accordingly, before

considering the above-identified issues on the merits, we first interpret the claim language in dispute. *See Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1567-68 (Fed. Cir. 1987) (In making a patentability determination, analysis must begin with the question, “*what* is the invention *claimed*?” since “[c]laim interpretation, . . . will normally control the remainder of the decisional process.”).

During examination, claim terms must be given their broadest reasonable construction consistent with the Specification. *In re ICON Health and Fitness, Inc.*, 496 F.3d 1374, 1379 (Fed. Cir. 2007).

The Specification states that the inventive water treatment system “can provide treated water to a point of use.” (Spec. 6:6-7.) “[T]reated water can be softened water, low Langelier Saturation Index (LSI) water or low conductivity water.” (Spec. 7:23-24.) Treated water is produced by a treatment device 16 for storage in a reservoir system 12 and ultimate delivery to point of use 18. (Spec. 7:6-9.) “Treatment device” is defined as “any apparatus that can be used to remove or reduce the concentration [sic] any undesirable species from a fluid to be treated.” (Spec. 7:26-28.) The Specification states that “[u]ndesirable species removed by treatment device 16 can be transferred to an auxiliary use or a drain 26.” (Spec. 7:9-10.) In an embodiment described in the Specification, treatment device 16 is an electrodeionization device which includes ion-depleting compartments 34 and ion-concentrating compartments 36 producing, respectively, a treated water product stream 56 and a concentrate or waste stream 58. (*See* Spec. 9:7-30.) The Specification does not define the term “waste stream,” but indicates that this stream may either go to a drain 26 or be sent to auxiliary uses, “for example, irrigating water to any residential, commercial or

industrial use, such as for irrigating, for recycling or for recovery of collected or concentrated salts.” (Spec. 16:18-20.)

Upon consideration of the claim language in light of the Specification, we interpret the term “waste stream” as used in claim 21 and “discharge water” as used in claim 40 as referring to one of at least two distinct streams produced by a treatment device, the other stream being a treated product stream. The waste stream/discharge water differs from the treated product stream in that it contains a greater concentration of the type(s) of species, e.g. ions, considered undesirable in the treated product stream.

Anticipation requires that every element and limitation of the claimed invention must be found in a single prior art reference, arranged as in the claim. *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383 (Fed. Cir. 2001).

Based on our claim interpretation, we are in agreement with Appellants that the Examiner reversibly erred in finding that Willman discloses fluidly connecting a waste stream, or transferring discharge water to an auxiliary use in the manner recited in claims 21 and 40. The stream entering Willman’s product dispenser (auxiliary use) 104 is the same permeate stream 34, i.e., a treated product stream, which is directed to Willman’s storage tank 26 for subsequent dispensing from product dispenser 28. (*See* Willman ¶ [0019] *supra* pp. 6-7.) Therefore, the Examiner erred in finding that a “waste stream” or “discharge water” as claimed enters Willman’s product dispenser since we interpret these terms as defining a stream which is distinct from a treated product stream.

Issue 2

Claim 62 recites “accumulating water from a point of entry at a pressure that is above atmospheric pressure.” Claim 70 recites “providing . . . a pressurizable reservoir system.”

The Examiner finds that these claim limitations are met because “Willman’s storage tank 26 is pressurized by way of booster pump 16 and transfer pump 58.” (Ans. 7 (*citing* Willman ¶¶ [0016] and [0018]).)

Willman describes the use of a booster pump 16 to elevate the water pressure of the filtrate stream exiting the pretreatment stage 12 to “a suitable operating pressure so as to provide an adequate driving force for the operation of the RO unit 18.” (Willman ¶ [0018].)

The disclosure in Willman relied upon by the Examiner does not describe pump 58. Pump 58 is first described in ¶ [0029] in which Willman states that “[h]igh-purity product water is pumped from storage tank 26 by a transfer pump 58 through the UV light treatment unit 54 and the DI module 56 and is returned to the storage tank 26.”

Appellants have persuasively argued that the Examiner reversibly erred in rejecting claim 62. The fact that storage tank 26 is positioned downstream from apparatuses which receive water from pump 16 and pump 58 is not sufficient to establish that Willman’s storage tank 26 accumulates water at a pressure above atmospheric pressure as required by appealed claim 62. (*See* App. Br. 28 and Rep. Br. 17 (noting that the Examiner’s findings appear to be based, in part, on Hirayama’s disclosure).)

Appellants’ arguments are not, however, persuasive of reversible error in the Examiner’s rejection of claim 70. Unlike the active step of accumulating water under pressure recited in claim 62, the “pressurizable

reservoir system” limitation of claim 70 is met by a reservoir system that is *capable of* being pressurized. *Cf. Intel Corp. v. U.S. Int'l Trade Comm'n*, 946 F.2d 821, 832 (Fed. Cir. 1991). Appellants have not provided persuasive arguments or evidence to refute the Examiner’s finding that Willman’s pump 16 is capable of pressurizing storage tank 62. Accordingly, Appellants have not shown reversible error in the Examiner’s rejection of claim 70 as anticipated by Willman. *Cf. In re Fox*, 471 F.2d 1405, 1407 (CCPA 1973) and *In re Kunzmann*, 326 F.2d 424, 425 n.3 (CCPA 1964) (accepting Examiner’s statement as true where appellant failed to question its accuracy or to present contradicting evidence).

Issue 3

Claim 51 recites “means for accumulating water from a water source at a pressure above atmospheric pressure.” Claim 68 recites “a pressurized fluid reservoir.”

The Examiner finds that these limitations, as well as the limitations in claims 62 and 70 identified in Issue 2 (*supra* pp. 10-11) are met by Hirayama because “the water pressure at each inlet to the electrochemical device 6, that is immediately adjacent and upstream of the tank 7, may be quite elevated (up to about 0.5 MPa, or 5 atmospheres) as a result of applied water pressure from the combination of pumps.”

Appellants have again persuasively argued that the mere positioning of tank 7 downstream from apparatuses which receive pressurized water is not sufficient to establish that Hirayama anticipates the argued limitations in claims 51, 62, and 68 (*see* App. Br. 24-27 and Rep. Br. 13-16). However, because Appellants have not provided persuasive arguments or evidence to refute the Examiner’s finding that Hirayama’s pumps are capable of

pressurizing storage tank 7 (*see* App. Br. 28 and Rep. Br. 16-17), Appellants have not shown reversible error in the Examiner's rejection of claim 70.

(*See* discussion of claim 70 under Issue 2, *supra*, p. 10-11.)

CONCLUSION

Appellants have identified reversible error in the Examiner's findings with respect to independent claims 21, 40, 51, 62, and 68, but have not shown reversible error in the Examiner's rejection of independent claim 70. Therefore, we reverse the following rejections:

claims 21-26, 40, 41, 44, and 45 under 35 U.S.C. § 102(e) as anticipated by Willman; claim 26 under 35 U.S.C. § 103(a) as unpatentable over Willman in view of Rela; claims 27 and 42 under 35 U.S.C. § 103(a) as unpatentable over Willman in view of Sato; claim 28 under 35 U.S.C. § 103(a) as unpatentable over Willman in view of Hirayama; claims 29 and 43 under 35 U.S.C. § 103(a) as unpatentable over Willman in view of Arba; claims 62 and 65-67 under 35 U.S.C. § 102(e) as anticipated by Willman; claims 51, 53, 54, 62, 65, 68, and 69 under 35 U.S.C. § 102(b) as anticipated by Hirayama; and claims 63 and 64 under 35 U.S.C. § 103(a) as unpatentable over Hirayama in view of Sato.

We affirm the rejections of 70 under 35 U.S.C. § 102(e) as anticipated by Willman and under 35 U.S.C. § 102(b) as anticipated by Hirayama

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED-IN-PART

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Appeal 2009-000740
Application 10/712,621

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